#### **Biosecurity: Perception is Not Reality -**The Need for a New Paradigm

**Satellite Conference** Tuesday, August 30, 2005 12:00-1:30 p.m. (Central Time

Produced by the Alabama Department of Public Health Video Communications & Distance Learning Division

#### **Faculty**

Jean-Pierre Vaillancourt, DMV, MSc, PhD **Professor** College of Veterinary Medicine University of Montreal, Canada

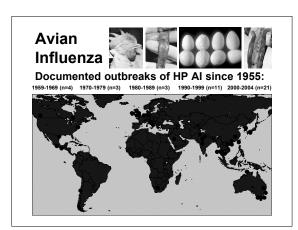
#### **Objectives**

- Present the current situation of farm biosecurity in the U.S.
- **Demonstrate and understand factors** contributing to non-compliance with respect to farm biosecurity.
- Understand how poor biosecurity could exacerbate an animal disease outbreak.
- Understand the need for regional and industry approaches to biosecurity.

#### 1978 - 2005

- Bordetellosis
- **Avian Nephritis**
- Avian Influenza
- H.V. Infec. Bursal Dis.
- Variant Infec. Bursal. Dis.
- Variant Infec. Bronchitis
- Ornithobacterium rhinotracheale infection
- Angara Disease
- **Runting Stunting Syndrome**
- Chicken Infectious Anemia
- **Trans. Viral Proventriculitis**
- Variant Mycoplasma G & S
- · Dermal Squamous Cell Carcinoma

- 1978 2005 Myeloid Leukosis
- **Turkey Rhinotracheitis**
- Cryptosporidiosis
- Spiking Mortality Syn.
- V.V. Marek's Disease
- **Pulmonary Hypertention**
- Sal. Enteritidis type 4
- Big liver & Spleen Disease
- **Equine Encephalitis**
- Stunting Syn. (turkeys)
- Poult Enteritis Mort. Syn
- **Multicentric Histiocytosis**
- Osteomyelitis complex
- **Pneumovirus**





"Nation will rise against nation...and there will be great earthquakes, and in various places plagues and famines..."

Luke 21, 10-11

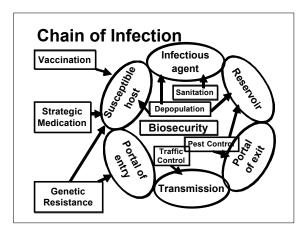




Bible: Hebrew soldiers returning from war were required to flame all their equipment and to plunge garments in boiling water.

Bible (Deuteronomy): Hebrew soldiers were provided with spades to bury their excreta.





Period	<b>Emphasis</b>	Stimulus
1900- 1940s	Care & sanitation	Control of parasites
1940s	Chemotherapy	Sulfa drugs; coccidiosis and salmonella
1950s	Antibiotics	Penicillin; tetracyclines; streptomycin - mixed bacterial infections
1970	Immunization	Marek's disease
Late 1980s	Testing & profiling	Complex viral diseases; ELISA
Ahead	Biosecurity	Economic Pressure; Public Health concerns

### **Top Ten Risks**

- 1. Employees attend cock fights
- 2. Wild birds in poultry houses
- 3. Employees own poultry
- 4. Family of employees own birds
- 5. High farm density in the region
- 6. Birds of 2 different ages in same house
- 7. Rodent infestation
- 8. More than one species of birds on farm
- 9. Shared dead bird disposal
- 10. Grower visits other poultry farms



Poultry International January 2002

Looking back at 1987 predictions...

"They were correct that, in health control, the emphasis would be on high levels of biosecurity including regular health status monitoring and flock profiling"

## Farm Characteristics - Biosecurity (% of 52 NC farms)

(70 OI 32 NO IAIIII3)	
Characteristic	% of farm
Gate at farm entrance	30.8
Sign advising to stay off farm	44.2
Requirements before a vehicle can enter	21.2
Access restricted if visitors have been in contact with	53.8
poultry  Dead bird container animal  proof	76.9

# 19% of farms had gates. Half (9%) used them.



## **An Industry On Wheels**

<ul> <li>Grower/Employees</li> </ul>	<ul> <li>Tractors</li> </ul>
<ul> <li>Cleaning crew</li> </ul>	<ul> <li>Loading crew</li> </ul>
<ul> <li>Livehaul (chickens)</li> </ul>	Feed truck
<ul> <li>Livehaul (equipment)</li> </ul>	• Fuel truck
Poult trailer	<ul> <li>Truck shop</li> </ul>
Shavings	<ul> <li>Snow plow</li> </ul>
Rendering truck	<ul> <li>Trash truck</li> </ul>
Servicemen	• etc.

# Infectious Laryngotracheitis in Niagara Peninsula Logistic regression on "flock disease status"

Factor	Coefficient	p-value	(95%CI)
			(**************************************
Vaccination	2.54	0.031	12.7
crew			(1.3-126)
Manure	2.09	0.016	8.1
handling			(1.5-45)

## **Requirements for Visitors**

Requirement	NC Turkey	Layers 99	Ontario Layers
Shower	12	3	3
Coveralls	67	18-32	36
Rubber boots	58	76	58
Plastic boots	64	-	•
Footbath	64	34	21
Сар	42	-	26
Hand sanitizer or gloves	23	-	13

(% of 52 NC farms; Layers 1999 NAHMS; Ontario Layers 1995)

## Survey Data Versus Validation Data

valluation Data			
Issue	Kappa	Agreement	
Boots	0.07	Low	
Using footbaths	0.19	Low	
Prior poultry visitors	0.23	Low	
Storage of dead birds	0.51	Fair / Good	
Disposal of dead birds	0.00	Low	

Risk Factor

MG status
Positive Negative

Coveralls YES 12 15
required for
visitors NO 22 2



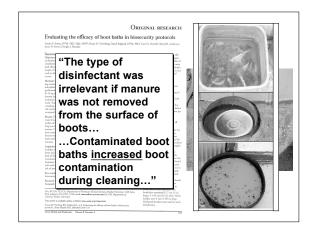
65% versus 12% Fisher Exact Test p = 0.0008 Risk Factor

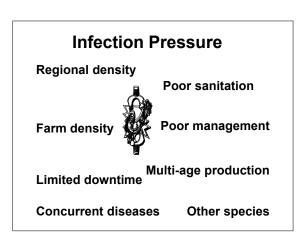
Rubber or YES 24 14

plastic
boots
required



25% versus 0% Fisher Exact Test p = 0.084



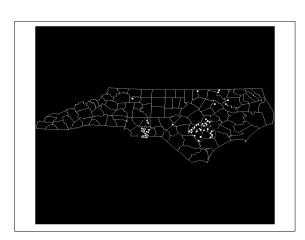


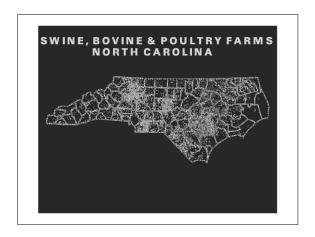
"Farm location was the factor most highly associated with the risk of reinfection. The second factor was the size of the neighbor's farm."

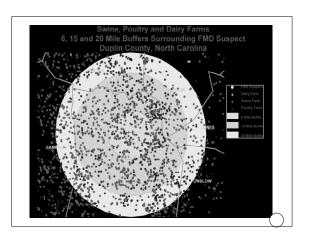
RFW Goodwin, 1985

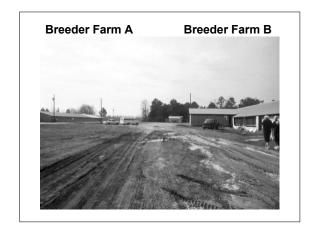


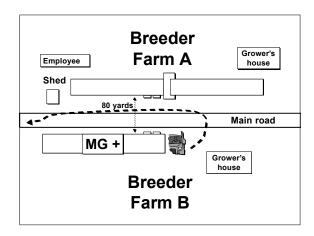
Reinfection of farms that were free of *Mycoplasma* 



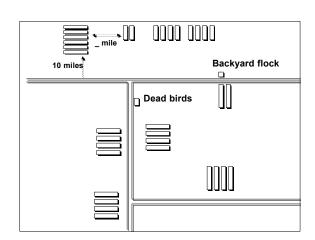


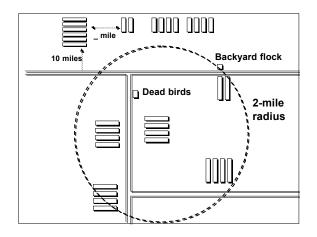


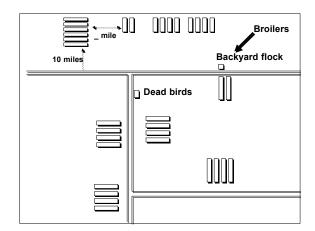


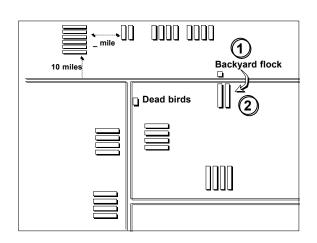


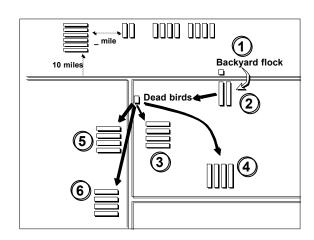


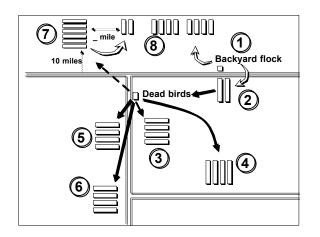












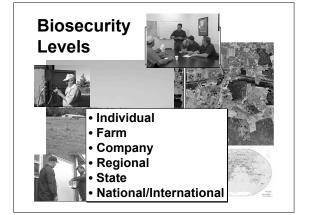
#### **Biosecurity on Breeder Farms** 179 respondents - census Based on your experience, before entering the barn, what is required of visitors? a) Putting on coveralls 82% b) Taking a shower 74% c) Using boots/footbaths 68% d) Putting on cap 65% e) Using hand sanitizer 51% f) Putting on gloves 32%



The extent to which a person's behavior coincides with medical or health advice



Haynes, Taylor, and Sackett (1979) "compliance in Health Care" 1422 references









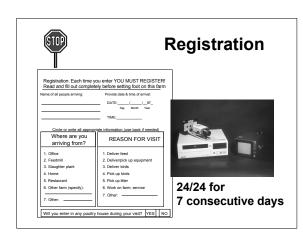


"If the growers are not brought into the effort to upgrade the biosecurity situation in the U.S. poultry industry, very little will be accomplished. The grower level is where the biosecurity effort needs to be concentrated because that is where the birds are."

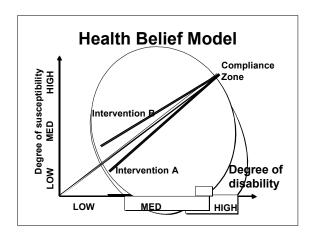


#### **Compliance Issues**

- Buy in
- Communication
- Education
- Incentives
- Realistic game plan
- Verification (markers)
- Regional perspective



#### **Comparison Between Video And Log-In System** Log-in System **Farm** Video % of (#/day) (#/day) Video 5.5 0.4 7.0 В 2.6 0.85 33.0 C 1.0 0.49 49.0 D 15.0 0.54 3.6



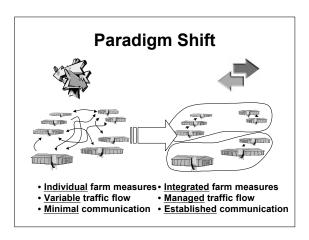
# Involvement in Decision-Making Process Discussion of Concerns Openness & Trust

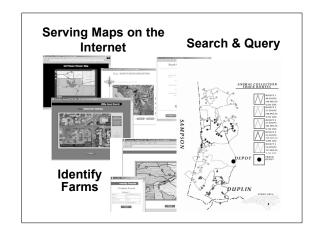
COMPANY MANAGEMENT VP production Production manager Veterinarian Main axis of engagement

FARM MANAGEMENT Grower

Employees Family

SATELLITE GROUPS Allied companies Utilities companies





#### Communication

#### **Regular Conditions**

- Educational programs for growers & employees
- Regular reporting of health status between Co.
- Audit of biosecurity rules
- Known health status of breeders for meat flocks

#### Epidemic

- Reporting health status of all farms in disease area
- Utilities companies
- Testing and reporting of all flocks at risk in
- Quarantine signs

